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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,507	08/29/2005	Dominique Hertz	12928/10021	9276

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EXAMINER	
PALABRICA, RICARDO J	

ART UNIT	PAPER NUMBER
3663	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/519,507	HERTZ ET AL.	
	Examiner	Art Unit	
	Rick Palabrica	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-25* is/are pending in the application.

4a) Of the above claim(s) *23 and 24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-22 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's 2/15/07 Response, which elected with traverse, Group I, and amended the claims of Group II, in response to the 1/11/07 Restriction Requirement of a previous examiner, is acknowledged.

2. Applicant argues that the amendment of process claim 23, to depend from product claim 20, obviates lack of unity of invention that was cited by the previous examiner as basis for the restriction. The current examiner disagrees.

The product claims 13-22 and 25 are still restrictable from the process claims 23 and 24. The amended claims still fall under the following groups:

I. Claims 13-22 and 25, drawn to a product.

II. Claims 23 and 24, drawn to a process of making the product.

Within Group I, however, there are two sub-groups; namely,

IA: Claims 13-19, 21, 22 and 25, drawn to a combination of absorbing rods and support.

IB. Claim 20, drawn to a subcombination of absorbing rods.

The inventions listed as Groups IA, IB, and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features because the groups do not belong to permitted combination of claims in different categories. See Annex B (Unity of Invention), Appendix AI (Administrative Instructions Under the PCT).

Additionally, the inventions listed as Groups IA, 1B and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the general inventive concept set forth, for example, in claims such as claim 20, does not define over the teachings of the prior art set forth, for example, in the applied art used in the rejection of the claims in this Office action.

The restriction is still proper and therefore made **FINAL.**

Claims 13-22, which are drawn to the elected invention, are examined in this Office action. Claims 23 and 24 are withdrawn from consideration because they are directed to the non-elected invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 13-20 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 13 and 25 recite the limitation, "the top end plugs of the absorber rods having hafnium cladding are of a titanium-based alloy and welded to a part of the upper extremity of the hafnium cladding of the absorber rod."

The claim is vague, indefinite and incomplete, and its metes and bounds cannot be determined as to which so-called part of the upper extremity is being referred to. For example, is it the inner part, outer part, end part, etc.?

The term "massive hafnium" in claim 20 is a relative term which renders the claim indefinite. The term "massive" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. .

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 13, 18-22, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Murakami et al. (U.S. 6,636,580) or Hertz et al. (U.S. 5,742,655) in view of either one of Ransohoff (U.S. 3,103,479) or Thibieroz et al. (U.S.6,614,869) in combination with Klepper et al. (U.S. 3,141,830). Either one of Murakami et al. or Hertz et al. disclose the applicant's claim limitations except for the materials for the cladding and the plugs.

As to claims 13, 20, 21, and 25, either one of Murakami et al. or Hertz et al. teach a cluster for adjusting a pressurized water reactor comprising: a) bundle of neutron-absorbing rods; b) metal cladding; c) spider support; d) top end plugs; and e) bottom

end plugs. See, for example, Figs. 5 and 6 in Murakami et al. or Figs. 2 and 3 in Hertz et al.

Either one of Ransohoff or Thibieroz et al. teach it is old and advantageous to use hafnium for cladding material of nuclear reactor control rods (see, e.g., Fig. 5 and col. 3, lines 30+ in Ransohoff or col. 2, lines 16+ in Thibieroz).

Klepper et al. teach nuclear fuel rods having top and bottom end plugs (see Figs. 1-11). They further teach that hafnium or titanium (in either metallic or alloy forms) are both suitable, alternative materials for the top and bottom end plugs because of their resilient property and they reduce the embrittlement of the cladding (see col. 4, lines 34+ and col. 5, lines 13+).

Note that the primary and secondary references are in the same field of endeavor, i.e., components in a nuclear reactor that are neutron absorbers. Klepper et al., for example, is directed to neutron absorbing rods because the fuel element is a neutron absorber. Also, when the Klepper et al. fuel elements are exposed to neutrons in the reactor, fissions of fissionable material in the fuel generate fission products that are neutron absorbers. The teaching in Klepper et al. is applicable to the primary references because both fuel elements (in Keppler et al.) and the cluster elements (in Murakami et al. or Hertz et al.) have upper and bottom end plugs. Both cluster elements and fuel elements are concerned with the problem of ensuring that gases generated inside the elements during operation do not adversely affect the integrity of the elements. It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem

with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by either one of Murakami et al. or Hertz et al., a) to use hafnium for cladding material for the neutron absorbing rods, by the teaching of either one of Ransohoff or Thibieroz et al., to gain the advantages thereof (e.g., good corrosion resistance and less susceptible to creep) and b) to use titanium alloy for the top end plug and hafnium for the bottom end plug, by the teaching of Klepper et al., to gain the advantages thereof (e.g., resiliency and reduces internal pressure in the element), because such modifications are no more than the use of well known expedients for cladding and plugs within the nuclear art.

As to the selection of titanium alloy or hafnium for either the top end plug or bottom end plug, this is a matter of design choice and/or optimization. As Keppler et al. teach, either material can be used for either one of the two plug locations. Therefore, the selection of using the same or different materials for the two end plugs, including what material to use for what plug becomes a matter of optimization that includes consideration of such factors as. structural and nuclear advantages of one material vs. the other, and balancing these with the cost of manufacture based on one material against the other.

As to the manner of attachment of the plugs by welding in the claims (e.g., claims 13, 18, 20, 22 and 25), this is a process of making the claimed product. As to product-by-process claims. MPEP 2113 states:

> "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777F.2d 695, 698, 227 USPQ 964, 966.

Thus, the claims are not patentable over the applied art. In any case, Thiebieroz et al. teach welding of the plugs (see col. 4, lines 45+). One having ordinary skill in the art at the time of the claimed invention would have been able to determine the appropriate welding technique for plug attachment.

Claims 15, 16, 17 and 19 are also product-by-process claims. Thus, as per MPEP 2113 shown above, these claims are not patentable over the applied art.

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Murakami et al. or Hertz et al. in view of either one of Ransohoff or Thibieroz et al. in combination with Klepper et al., as applied to claims 13, 18-22, and 25 above, and further in view of Bernard (U.S. 3,467,398).

Bernard teaches TA6V as a good seal material between two members subjected to high temperatures and a corrosive fluid (see col. 1, lines 31+ or col. 2, lines 23+). Bernard teaches a seal material for the same environment where the modified Murakami et al. or Hertz et al. cluster assembly is used. Thus, Bernard is in an analogous art as the modified Murakami et al. or Hertz et al. Therefore, it would

have been intuitively obvious to one having ordinary skill in the art at the time of the claimed invention to use a TA6V titanium alloy for the top end plugs for the modified Murakami et al. or Hertz et al. device.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:00-4:30, Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RJP
May 18, 2007

RPalabrica

RICARDO J. PALABRICA
PRIMARY EXAMINER